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OBJECTIVE MEASURES OF PHYSICAL ACTIVITY LEVELS OF ALBERTA CHILDREN AND YOUTH

Report Written by:
Canadian Fitness and Lifestyle Research Institute
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Executive Summary: Objective Measures of Physical Activity Levels of Alberta Children and Youth

In the 2005–2006 school year, Alberta Education initiated a requirement of 30 minutes of Daily Physical Activity (DPA) for all students in grades 1 to 9. Early in 2005, Alberta Education contracted the Canadian Fitness and Lifestyle Research Institute (CFLRI) to assist with research on the DPA initiative. The project involved expert interviews, a literature review (available on the Alberta Education Web site at www.education.gov.ab.ca/k_12/curriculum/bysubject/dpa4youth.pdf) and collection of pedometer data on the physical activity levels of Alberta youth (summarized in this report). The objectives of this research were to gather information regarding:

- promising practices
- types of research and evaluation studies performed to date
- types of measurement tools that may be useful
- expert opinion of what should be measured both from an evaluation standpoint and a research standpoint
- baseline measurement of the average number of steps Alberta children take.

In order to obtain baseline pedometer data, Alberta Education contacted CFLRI to determine if it was possible to obtain provincial data from the *Canadian Physical Activity Levels Among Youth* (CANPLAY) study. The CANPLAY study is a nation-wide study that reports data by regions only, so Alberta Education contracted CFLRI to collect an oversample of 1100 children and youth. This extended sample provided Alberta with a large enough sample size to analyze data at the provincial level.

The CANPLAY data represents part of the series of CANPLAY studies that will be conducted annually until 2008. Approximately 10 000 children and youth (aged 5–19 years) across Canada are randomly selected and recruited into the study per year. In the first year, approximately 6000 young people nation-wide complied with the study protocol.

This report provides findings from the pedometer data collection conducted in Alberta from April 1, 2005, to November 1, 2006 (including the oversample collected in the summer of 2006), as part of the CANPLAY study.

Key Findings (pages 5–27)

- Alberta children appear to be slightly more active than Canadian children on average:
  - Alberta average: 12 199 steps/day
  - national average: 11 685 steps/day.
- However, 86% of Alberta children do not meet the criteria of accumulating 16 500 steps daily (associated with meeting Canadian guidelines for physical activity for children and youth).
- Children of parents with post-secondary education and higher incomes generally have a higher step count than children of parents with less than a secondary education and lower incomes.

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- Boys and younger children generally have a higher step count than girls and older children.
- On average, children in Alberta who reportedly *prefer* to be physically active take more steps per day than children who state a *preference* for sedentary activities.
- Children who participate in organized physical activity or sports take more steps per day than children who do not.
- Children who prefer a combination of unorganized and organized activities take more steps than those who prefer either only unorganized or only organized activities.
- Children who prefer vigorous-intensity activities take more steps daily than those who prefer moderate-intensity activities.
- Children who prefer vigorous-intensity activities take more steps than children who like *neither* moderate nor vigorous-intensity activities.

Recommendations (pages 28–30)

This study helps to demonstrate that solutions to the physical inactivity that all too often characterizes the modern lifestyle of children must be home-, school- and community-centred. These solutions are fundamental to ensuring the future health of Alberta youth. The study makes the following recommendations.

- A public education campaign targeted to parents to regulate screen (television, video games and computer) time, particularly among younger children, may be warranted in an effort to increase the amount of time available for more active pursuits.
- A comprehensive strategy that focuses on children and their parents is warranted and should include:
  - increased awareness about physical activity
  - changing the physical environment available to youth to facilitate more physical activity opportunities
  - strategies to increase active commuting, including promotion and ensuring that there are safe routes to schools
  - ample opportunities for daily physical activity at school for all children and youth, which can include further promotion of provincial standards, proven curriculum-based programs like CATCH or the quality daily physical education of the Canadian Association for Physical and Health Education, Recreation and Dance
  - increased opportunities for a variety of physical activities in the community and at home
  - inclusive programs to ensure that everyone can play, regardless of motor development, skills, abilities or disabilities, gender, age or culture.

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Introduction

In September 2005, Alberta Education implemented a requirement for 30 minutes of Daily Physical Activity (DPA) for all students in grades 1 to 9. The policy statement provided for significant latitude in terms of the approach used to achieve the initiative's goals. The following are key tenets of the DPA policy statement:

- Boards have the flexibility to use instructional and/or noninstructional hours to implement DPA.
- Physical education classes are an appropriate strategy to meet the DPA requirement.
- DPA should be offered in as large a block of time as possible but can be offered in time segments adding up to the minimum 30 minutes per day (e.g., two fifteen-minute blocks of time for a total of 30 minutes).
- DPA can be incorporated throughout the day and integrated into other subject areas.
- School boards will monitor the implementation of DPA to ensure that all students are active for a minimum of 30 minutes daily.
- Exemptions from DPA may be given by the principal under the following conditions:
  - religious beliefs – upon written statement from the parent to the principal
  - medical reasons – certification to principal by a medical practitioner indicating which activities the student is not able to participate in.

The Canadian Fitness and Lifestyle Research Institute (CFLRI) was contracted by Alberta Education to assist in the measurement of its DPA initiative. The project involved expert interviews, a literature review and the collection of step data to gather information regarding:

- promising practices
- types of research and evaluation studies performed to date
- types of measurement tools that may be useful
- expert opinion of what should be measured both from an evaluation standpoint and a research standpoint
- a baseline measurement of the number of steps Alberta children take on average.

Findings from the expert interviews and the literature review have been submitted in separate reports. This report provides findings from the pedometer data collection conducted in Alberta from April 1, 2005, to November 1, 2006 (including the oversample collected in the summer of 2006), as part of the CFLRI's *Canadian Physical Activity Levels Among Youth* (CANPLAY) study.

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Background of the Study

Federal, provincial and territorial ministers responsible for physical activity have invested in the collection of data, using objective measures to examine physical activity levels of school-aged children and youth. Funded jointly by the Public Health Agency of Canada and the provinces and territories through the Interprovincial Sport and Recreation Council, the Canadian Fitness and Lifestyle Research Institute launched the *Canadian Physical Activity Levels Among Youth* (CANPLAY) study to provide an effective and objective means for studying physical activity patterns of Canada's young people.

CANPLAY is the first large-scale, representative, nation-wide study using pedometers to measure physical activity in Canada. National surveys have traditionally relied on self-report physical activity questionnaires for teenagers and parental proxy reports for younger children (e.g., under 12 years of age). The accuracy of the self-report data is particularly a concern for children and youth who do physical activity in bursts that may not be accurately recalled. In addition, parental proxy reports not only suffer from this limitation, but may be further limited by a lack of detailed knowledge of their children's physical activity.

The objective measurement of children's physical activity levels using pedometers has three advantages over previous proxy and self-report information: (1) it is likely to provide a more accurate picture of the total daily physical activity levels of Canada's young people, as it avoids recall bias and can overcome the issue of recalling bursts of activity; (2) it provides an estimate of overall physical activity rather than being restricted to one domain (e.g., leisure time); and (3) research has shown that data from pedometers are correlated to data collected by accelerometers, observation and direct measures of energy expenditure.[1] In addition to these advantages, pedometers can be a relatively low-cost tool to measure activity patterns on a large scale compared to other types of objective measures.[2] The pedometer data collected through the CANPLAY study will be critical in helping governments to develop long-term solutions and programs for a more active and healthier younger generation.

The pedometer employed in CANPLAY (Yamax NL-2000 and now SW-200) is highly accurate in counting steps.[3] Research has shown that these pedometers detect roughly 15 erroneous steps during a 20-mile car ride,[4] which is considered a minimal source of error (<0.2% of the average number of daily steps expected of children and adults), thereby alleviating concern that motorized transit would inaccurately affect the number of steps recorded. Similarly, research during a study with either sealed[5] or unsealed pedometers[6] has shown that reactivity is not an issue among children wearing pedometers, indicating that concern about potential reactivity to the pedometer—that is, a change in behaviour as a result of the participants' awareness that they are being "monitored"—is minimal. Overall, therefore, the choice to use these pedometers to objectively measure the physical activity level of children and youth has a number of advantages with minimal limitations.

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Data Collection

These data represent part of the series of CANPLAY studies that will be conducted annually until 2008. Approximately 10 000 children and youth (aged 5–19 years) across Canada are randomly selected and recruited into the study per year. In the first year, approximately 6000 young people nation-wide complied with the study protocol.

The sample for CANPLAY is selected using telephone interviews conducted by the Institute for Social Research (ISR) at York University in Ontario. To select individual survey respondents, a two-stage probability selection process is necessary. The first stage involves the inclusion of households by randomly selecting telephone numbers, using a form of random digit dialling (RDD). The second stage of the sample selection process includes the random selection of a respondent, 20 years of age or older, who is a parent or legal guardian of a child or young adult between 5 and 19 years of age who lives in the household. During this telephone interview, ISR directly captures data on several correlates or factors associated with physical activity, using a computer-assisted telephone interview (CATI) system.

If parents verbally agree to their children's participation in the pedometer portion of the study (n≈6000 families during the first year of collection), the family is sent a package in the mail that includes:

- a pedometer for each participating child
- a step log/assent form (a one-page document that includes a recording section to log daily steps and a written assent for parents of younger children, and for children over 14 themselves, to sign, indicating their agreement with participation in the study)
- a one-page illustrated step-by-step guide that describes how to participate in the study and how to wear the pedometer
- a one-page letter describing the study and contacts for study ethics concerns
- a teacher/coach letter that informs teachers and coaches about the study, in case they question the child's wearing the pedometer during activities they supervise
- a small gift of thanks for participating
- a postage-paid reply envelope.

Packages are tracked for their receipt. Several days after verification of receipt of the package, the participating family receives a short courtesy phone call to:

- determine if there were questions related to the study
- remind participants that they could and should begin immediately
- remind participants to return the completed step log/assent form and pedometer when completed
- thank them again for their participation.

The participating children wear the pedometer for 7 consecutive days. Each day's steps are logged onto the daily log form (recognizing day of the week worn and the day the study was started). If participants have not returned their completed data and pedometer within 6–8 weeks, a letter is distributed to participating families reminding them of the importance of returning the package. Data received by the CFLRI are entered and verified for data entry accuracy.

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FINDINGS

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How Active Are Alberta's Children and Youth?

According to the Canadian Fitness and Lifestyle Research Institute's *Canadian Physical Activity Levels Among Youth* (CANPLAY) study, Alberta's children and youth (aged 5–19) take an average of 12 199 steps per day, as recorded by a pedometer. This is slightly higher than the national average of 11 685 steps per day.

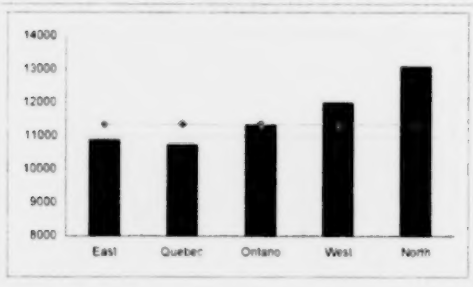
Child's Age and Sex Boys in Alberta are more active than girls, taking an average of 1400 more steps per day. Younger children are also more active than older children; 15–19 year olds take about 1900 fewer steps than 11–14 year olds, and about 2500 fewer steps than 5–10 year olds.

Child's Participation in Organized Physical Activities and Sports Alberta children who participate in organized physical activities and sports take about 1600 more steps per day than nonparticipating children in Alberta.

Parent's Activity Level There are no significant step count differences in terms of parent level of activity.

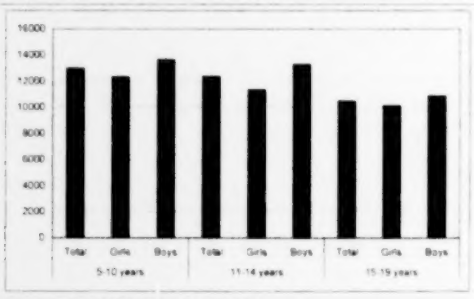
Socio-economic and Demographic Factors While there are apparently no significant differences in terms of household income and community size, parental level of education is related to Alberta children's daily step counts. That is, children whose parents have a post-secondary education take more steps per day than do children whose parents have not graduated from high school.

MEAN NUMBER OF STEPS FOR CHILDREN AND YOUTH by region



2005–2006 CANPLAY Study, CFLRI

MEAN NUMBER OF STEPS FOR CHILDREN AND YOUTH by child's age and gender, Alberta



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Mean Number of Steps for Children and Youth in Alberta

Alberta Preliminary Data, 2005–2006 CANPLAY Study, CFLRI

	Mean Number of Steps
ALBERTA TOTAL, CHILDREN (5–19)	12199
girls	11485
boys	12927
5–10	13017
girls	12357
boys	13657
11–14	12386
girls	11401
boys	13319
15–19	10491
girls	10146
boys	10911
PARENT'S EDUCATION LEVEL	
Less than secondary	10516
Secondary	12035
College	12457
University	12242
HOUSEHOLD INCOME	
< $20,000	11200
$20,000–29,999	12748
$30,000–39,999	12468
$40,000–59,999	12590
$60,000–79,999	11747
$80,000–99,999	11752
• $100,000	12747
PARENTAL ACTIVITY PATTERNS COMPARED TO OTHER ADULTS	
Substantially more active	12421
Slightly more active	12449
Just as active	12135
Slightly less active	11901
Substantially less active	11061
CHILD PARTICIPATES IN ORGANIZED PHYSICAL ACTIVITY OR SPORT	
Yes, child participates	12582
No, child does not participate	10962

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Accumulating Sufficient Steps to Meet Recommendations

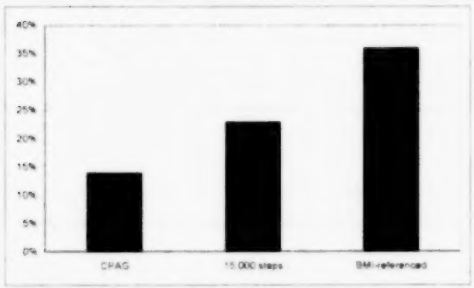
How many daily steps should children and youth take for health and to develop a lifelong active lifestyle? No definitive answer has yet been determined; however, several guidelines have been suggested. A recent study comparing children's current activity level and body mass suggests that accumulating 12 000 daily steps for 6–12 year old girls and 15 000 daily steps for 6–12 year old boys is associated with having a healthy weight.[7] Epstein[8] has suggested that 120 to 150 minutes of daily activity are required for boys and girls alike; this amount is comparable to accumulating about 15 000 steps daily. Recognizing that childhood is a time to acquire the skills and lifelong habits for physical activity, and given the fact that the rate of obesity has increased among Canadian children, Canada's Physical Activity Guide[9] for children and youth sets a goal of adding 90 minutes of moderate to vigorous activity to the incidental activities required by daily living. This amount is equivalent to 16 500 steps daily, using the same logic as that used to establish the 10 000 steps guideline for adults.

Depending on which of these criteria is used, between 64–86% of children and youth residing in Alberta do not accumulate sufficient daily steps. More specifically,

- 64% of children and youth aged 5–19 in Alberta do not accumulate sufficient daily steps to meet the sex-specific criteria associated with a healthy body mass index (BMI)
- 77% (an additional 13%) do not meet the criteria of accumulating at least 15 000 steps daily
- 86% (a further 9%) of children in Alberta do not accumulate the 16 500 steps criteria associated with Canada's guidelines for children and youth.

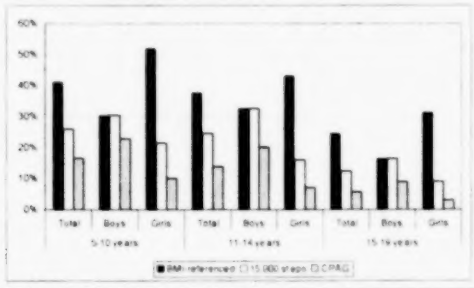
Child's Age and Sex As reported above, boys in Alberta accumulate more steps daily on average than do girls. As expected, therefore, boys in Alberta are more likely than girls to meet Canadian guidelines and the 15 000 step criteria. In contrast, more girls than boys meet the sex-specific BMI-referenced criteria. The percentage of children and youth meeting these three criteria generally decreases with increasing age group. Significantly fewer 15–19 year olds than younger children in Alberta meet the Canadian guidelines (equivalent to 16 500 steps), the BMI-referenced criteria and the 15 000 steps criteria. An age-related decline is observed for boys when measured against the Canadian guidelines and for girls meeting the BMI-referenced or the 15 000 step criteria.

MEETING RECOMMENDATIONS
overall, Alberta



2005–2006 CANPLAY Study, CFLRI

MEETING RECOMMENDATIONS
by child's age and sex, Alberta



2005–2006 CANPLAY Study, CFLRI

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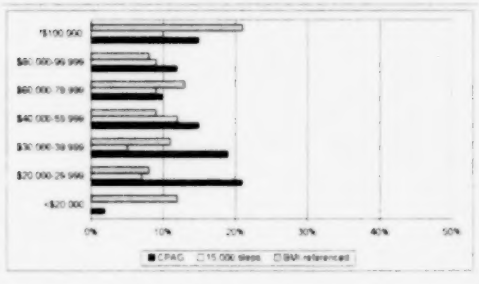
Child's Participation in Organized Physical Activities and Sports Children who participate in organized physical activities and sports are more likely to meet the BMI-referenced criteria and the 15 000 steps criteria, compared to those who do not engage in organized activity. For Alberta children, participation in organized physical activities or sports does not appear to be related to the likelihood of meeting the Canadian guidelines of 16 500 steps.

Socio-economic and Demographic Factors Alberta children living in the lowest income households (with an annual income less than $20,000) are less likely to meet the sex-specific BMI-referenced criteria for sufficient activity and the 15 000 steps criteria compared to those living in the highest income households (annual incomes of $100,000 or more). No difference by household income is apparent with the criteria for accumulating the 16 500 steps criteria associated with Canada's Physical Activity Guide. No differences are observed by parent's education for the BMI-referenced criteria and the 16 500 steps criteria. Children in Alberta whose parents are university educated, however, are more likely to meet the 15 000 steps criteria compared to those whose parents have less than a secondary school education. There are no differences in the proportion of children meeting the BMI-referenced criteria, the 15 000 steps criteria and the 16 500 steps criteria by community size.

MEETING RECOMMENDATIONS
by household income, Alberta



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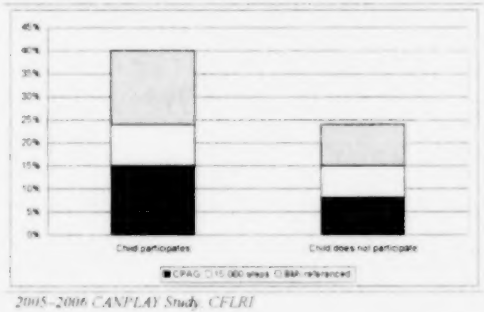
MEETING RECOMMENDATIONS
by child's participation in sport, Alberta



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Participation in Organized Physical Activity or Sports

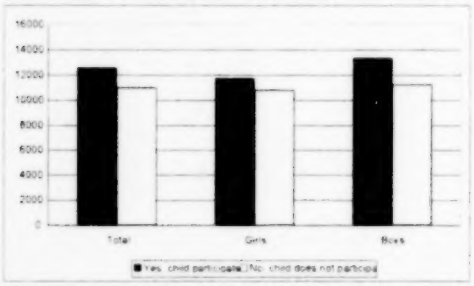
On average, children in Alberta who participate in organized physical activity or sports take about 1600 more steps per day than children who do not. The activity location (*at* or *outside of* school) does not appear to have an impact on step count totals.

Child's Age and Sex In Alberta, boys who participate in organized physical activity or sports take more steps than their nonparticipating counterparts, though this is not the case for girls. Of children who participate in organized activities, boys take more steps than girls do; however, this difference between boys and girls is associated with the location of the organized activity. Boys participating in organized activities *outside* of school take more steps than girls who do so, while there is no gender difference among those who perform the activity only *at* school. There is a significant difference in steps between children aged 11–14 who participate in organized physical activities and children of the same age who do not, and this difference is most apparent for boys. If the organized activity is performed *outside* of school, those aged 15–19 take fewer steps than their youngest counterparts (aged 5–10).

Socio-economic and Demographic Factors There are no significant differences in step counts between children who do or do not participate in organized physical activity, with respect to household income. This is also the case when looking at the location of the organized activity. Children who participate in organized activities and whose parents hold a university education take more steps than children who do not participate in such activities but whose parents are university educated. There are no differences in examining the location of the organized activity with parental education.

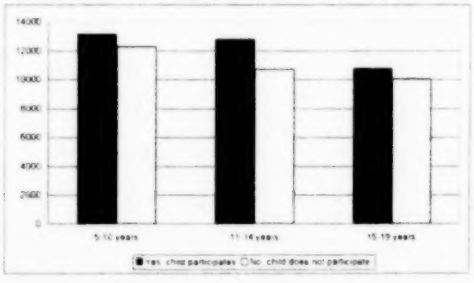
Parent's Activity Level Children who participate in organized physical activity or sports, and whose parents report being slightly more active than other adults, take about 1800 more steps per day than those children who do not participate. This difference increases slightly to 2000 steps for children whose parents report being slightly less active than other adults.

PARTICIPATION IN ORGANIZED PHYSICAL ACTIVITY AND STEPS TAKEN by child's sex



2005–2006 CANPLAY Study, CFLRI

PARTICIPATION IN ORGANIZED PHYSICAL ACTIVITY AND STEPS TAKEN by child's age



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Participation in Organized Physical Activity or Sports

Alberta Preliminary Data, 2005–2006 CANPLAY Study, CFLRI

	Participates in organized physical activity or sport	Does not participate in organized physical activity or sport
ALBERTA TOTAL, CHILDREN (5–19)	12582	10962
girls	11749	10780
boys	13353	11216
5–10	13178	12267
girls	12412	12137
boys	13860	12454
11–14	12796	10708
girls	11719	10274
boys	13759	11228
15–19	10795	10019
girls	10310	9931
boys	11314	10149
PARENT'S EDUCATION LEVEL		
Less than secondary	10862	–
Secondary	12353	11230
College	12779	11396
University	12659	10475
HOUSEHOLD INCOME		
< $20,000	–	–
$20,000–29,999	13495	–
$30,000–39,999	13800	–
$40,000–59,999	12706	12318
$60,000–79,999	12215	10621
$80,000–99,999	11926	11099
• $100,000	13123	10763
PARENTAL ACTIVITY PATTERNS COMPARED TO OTHER ADULTS		
Substantially more active	12823	11056
Slightly more active	12796	10987
Just as active	12485	11230
Slightly less active	12373	10385
Substantially less active	–	–

– Data unavailable because of insufficient sample size

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Preference for Active vs. Sedentary Activities

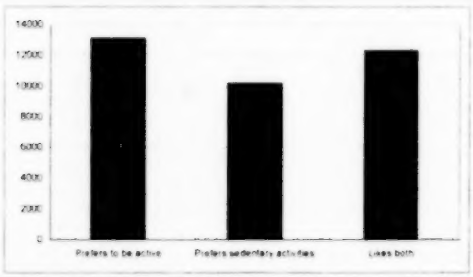
On average, children in Alberta who reportedly *prefer* to be physically active take about 2900 more steps per day than children who state a *preference* for sedentary activities. There are no significant differences in the amount of steps taken by children living in Alberta who *prefer* to be physically active and those who report that they like *both* sedentary and physical activities *equally*.

Child's Age and Sex Among girls living in Alberta, those preferring to be active take about 2100 more steps per day than girls who prefer sedentary activities. For boys, however, this difference increases to roughly 3500 steps. Overall, there are no differences in the amount of steps taken for children who prefer to be active, with increasing age; however, for children who prefer to do sedentary activities, 15–19 year olds take about 2900 fewer steps than do 5–10 year olds. This pattern is also evident among children who like both types of activities equally well; that is, 15–19 year olds take about 2100 fewer steps than their younger counterparts.

Child's Participation in Organized Physical Activities and Sports Among children living in Alberta who *actually participate* in organized physical activities and sports, those who prefer to be active take about 2100 more steps than children who prefer sedentary activities. Interestingly, among children who do not participate in organized activities, this difference increases to almost 4000 steps. Looking at the data another way, for children living in Alberta, there are no differences in the number of steps taken among those who prefer to be active or those who prefer to be sedentary, according to whether or not they participate in organized activities. Part of this finding is contrary to what is found at the national level, where Canadian children who *prefer* to be physically active and who *actually participate* in organized physical activities or sports take more steps in a day than those who do not participate.

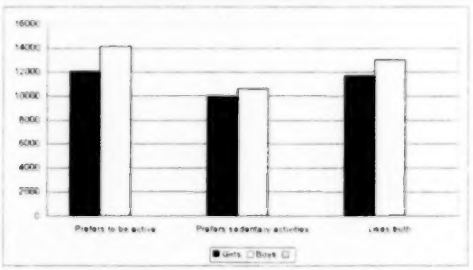
Parent's Activity Level Generally speaking, children who prefer sedentary activities take fewer steps on average than those who prefer to be active regardless of the parent's reported activity level (compared to their peers).

ACTIVITY PREFERENCES BY STEPS TAKEN overall, Alberta



2005–2006 CANPLAY Study, CFLRI

ACTIVITY PREFERENCES BY STEPS TAKEN by child's sex, Alberta



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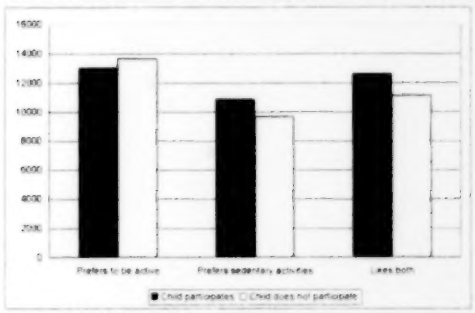
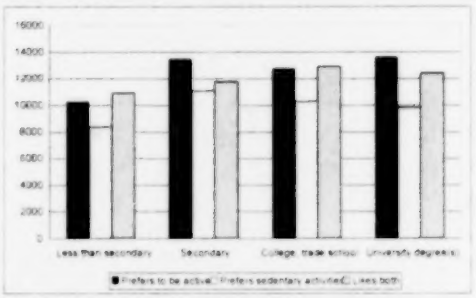
Socio-economic and Demographic Factors There are significant step count differences between Alberta children who prefer active activities over sedentary activities when their parents have a post-secondary level of education. For example, if parents have a college education, children who prefer to be active take roughly 2500 more steps than those who prefer to be sedentary. This increases to roughly 3800 more steps if the parent has a university education. Children who prefer to be active take substantially more steps (3300 to 4000 more steps) than those who prefer sedentary activities if they are from high income households (i.e., over $80,000 per year).

ACTIVITY PREFERENCES BY STEPS TAKEN by child's participation in organized physical activities and sports, Alberta



2005–2006 CANPLAY Study, CFLRI

ACTIVITY PREFERENCES BY STEPS TAKEN by parent's education level, Alberta



2005–2006 CANPLAY Study, CFLRI

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Children's Preferences for Level of Activity

Alberta Preliminary Data, 2005–2006 CANPLAY Study, CFLRI

	Prefer to be physically active	Prefer quiet activities	Like both equally
ALBERTA TOTAL, CHILDREN (5–19)	13127	10213	12348
girls	12060	9925	11704
boys	14104	10582	12993
5–10	13378	11947	12996
girls	12334	–	12374
boys	14340	–	13601
11–14	13812	10585	12468
girls	12517	10017	11536
boys	14664	11225	13382
15–19	11592	9011	10863
girls	–	8683	10656
boys	–	9495	11091
PARENT'S EDUCATION LEVEL			
Less than secondary	–	–	10906
Secondary	13465	11083	11744
College	12736	10281	12887
University	13599	9811	12387
HOUSEHOLD INCOME			
< $20,000	–	–	–
$20,000–29,999	–	–	12819
$30,000–39,999	–	–	14186
$40,000–59,999	13993	–	12671
$60,000–79,999	12191	10059	11982
$80,000–99,999	13941	9987	11598
• $100,000	13559	10260	12923
PARENTAL ACTIVITY PATTERNS COMPARED TO OTHER ADULTS			
Substantially more active	13092	9930	12862
Slightly more active	13015	10625	12529
Just as active	13095	10669	12200
Slightly less active	–	–	12055
Substantially less active	–	–	–
CHILD PARTICIPATES IN ORGANIZED PHYSICAL ACTIVITY OR SPORT			
Yes, child participates	13031	10890	12638
No, child does not participate	13637	9668	11127

– Data unavailable because of insufficient sample size

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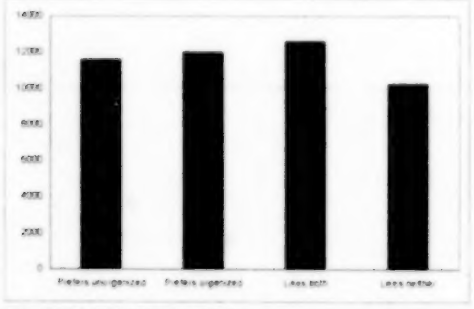
Preference for Organized vs. Unorganized Activities

In addition to being asked whether or not their children *participate* in organized activities, parents were asked about their children's *preferences* concerning participation in organized and unorganized activities. The 2005–2006 CANPLAY study examined whether these preferences were associated with the average number of steps children take. Children living in Alberta who like to participate in *both* types of activity take roughly 1000 more steps than those who prefer unorganized activities *solely*. There are, however, no significant differences between children who like to participate in *both* types of activity and children who prefer organized activities *solely*. Children who *neither* like organized nor unorganized activities take about 2400 fewer steps than those who like *both* organized and unorganized activities *equally*.

Child's Age and Sex Among boys living in Alberta, those who like *both* unorganized and organized activities *equally* take more steps than those who prefer *only* unorganized activities; however, there are no differences in preferences for girls. Generally, boys living in Alberta take an equal number of steps as girls irrespective of preference, with one notable exception. Among children who like *both* organized and unorganized activities, boys take roughly 1700 more steps than girls. This pattern differs from the national population, where boys generally take more steps than girls regardless of preference. Among 11–14 year old children, those who like *both* types of activity take a greater number of steps compared to those who prefer unorganized activities *solely* and those who like *neither* type of activity, though this only appears to be the case among boys.

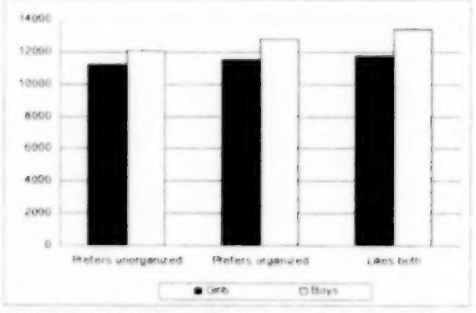
Child's Participation in Organized Physical Activities and Sports Among children who prefer unorganized activities *solely* or *both* unorganized and organized activities *equally*, those actually participating in organized sports or physical activities take more steps in a day than those who do not.

ORGANIZED VS. UNORGANIZED PHYSICAL ACTIVITIES BY STEPS TAKEN
overall, Alberta



2005–2006 CANPLAY Study, CFLRI

ORGANIZED VS. UNORGANIZED PHYSICAL ACTIVITIES BY STEPS TAKEN
by child's sex, Alberta



2005–2006 CANPLAY Study, CFLRI

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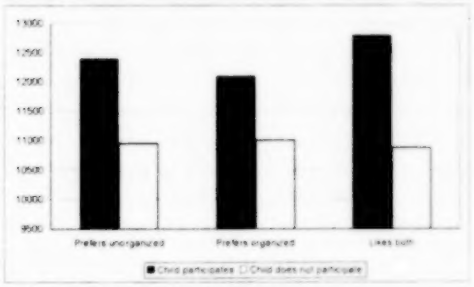
Parent's Activity Level There are no differences in children's step counts and their parent's self-assessed activity level, when examined in relation to their preferences for activity.

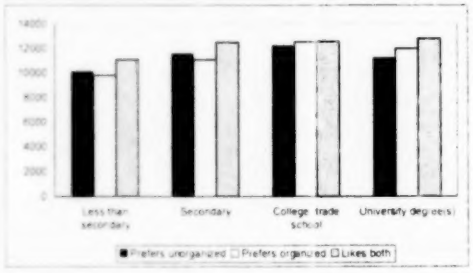
Socio-economic and Demographic Factors Among children whose parents have a university education, those who like *both* organized and unorganized activities *equally* accumulate a greater number of daily steps compared to those children who prefer *only* unorganized activities. There are no apparent differences in step counts and preferences for activity in relation to household income.

ORGANIZED VS. UNORGANIZED PHYSICAL ACTIVITIES BY STEPS TAKEN by child's participation in organized physical activities and sport, Alberta



2005–2006 CANPLAY Study, CFLRI

ORGANIZED VS. UNORGANIZED PHYSICAL ACTIVITIES BY STEPS TAKEN by parent's education level, Alberta



2005–2006 CANPLAY Study, CFLRI

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Children's Preferences for Type of Activity

Alberta Preliminary Data, 2005–2006 CANPLAY Study, CFLRI

	Prefer organized activities	Prefer unorganized activities	Like both equally	Prefer neither
ALBERTA TOTAL, CHILDREN (5–19)	12002	11597	12626	10264
girls	11514	11193	11720	–
boys	12762	12058	13405	–
5–10	13662	12585	13141	–
girls	–	12310	12244	–
boys	–	12924	13906	–
11–14	12506	11128	12998	–
girls	11909	10558	11699	–
boys	–	11690	13957	–
15–19	10506	10565	10357	–
girls	9900	10023	10334	–
boys	–	11189	10383	–
PARENT'S EDUCATION LEVEL				
Less than secondary	–	10149	–	–
Secondary	11106	11604	12524	–
College	12589	12272	12616	–
University	12019	11287	12805	–
HOUSEHOLD INCOME				
< $20,000	–	–	–	–
$20,000–29,999	–	–	13564	–
$30,000–39,999	–	10866	15453	–
$40,000–59,999	–	12403	12794	–
$60,000–79,999	–	11153	12314	–
$80,000–99,999	–	11095	12063	–
• $100,000	12970	11929	13050	–
PARENTAL ACTIVITY PATTERNS COMPARED TO OTHER ADULTS				
Substantially more active	13870	12170	12377	–
Slightly more active	11689	11682	12995	–
Just as active	12122	11500	12422	–
Slightly less active	–	11344	12881	–
Substantially less active	–	–	–	–
CHILD PARTICIPATES IN ORGANIZED PHYSICAL ACTIVITY OR SPORT				
Yes, child participates	12103	12394	12791	–
No, child does not participate	–	10952	10875	–

– Data unavailable because of insufficient sample size

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Preference for Vigorous-intensity or Moderate-intensity Activities

Parents were also asked about their children's *preferences* concerning the intensity of the activity in which their children participate. Based on preliminary analysis of the Alberta data of the 2005–2006 CANPLAY survey, children who prefer vigorous-intensity activities take roughly 1400 more steps daily than those who prefer moderate-intensity activities, and 3500 more steps than children who like *neither* moderate- nor vigorous-intensity activities. There are no differences in the amount of steps taken by children who prefer *solely* vigorous-intensity activities compared to those who like to do *both* moderate- and vigorous-intensity activities *equally*.

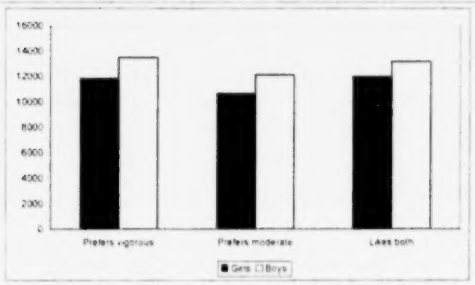
Child's Age and Sex Boys living in Alberta who prefer solely vigorous-intensity or solely moderate-intensity activities take more steps than girls who have the same preferences. Among girls, those who prefer *only* vigorous activities take more steps than girls who like *neither* type of activity. Among those children preferring *solely* vigorous activities or *solely* moderate activities, teens (15–19 years) take fewer steps than their younger counterparts (5–10 years). Similarly, among children who *equally* like *both* moderate and vigorous activities, teens take fewer steps than younger children.

Child's Participation in Organized Physical Activities and Sports Among organized physical activity and sports participants, children who like *both* vigorous and moderate activities *equally* take more daily steps than do those who prefer only moderate activities. Among children who like both vigorous and moderate activities equally, those participating in organized activities or sports take more steps than those who do not.

Parent's Activity Level In Alberta, there are no differences in the amount of steps taken by children and their preferences for the intensity of an activity, when taking into account parent's activity level.

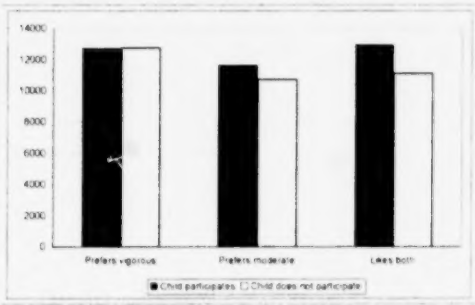
Socio-economic and Demographic Factors There are no significant differences in the number of steps taken by intensity preference when examining parental education level, community size or household income.

VIGOROUS VS. MODERATE ACTIVITIES BY STEPS TAKEN by child's sex, Alberta



2005–2006 CANPLAY Study, CFLRI

VIGOROUS VS. MODERATE ACTIVITIES BY STEPS TAKEN by child's participation in organized physical activity and sport, Alberta



2005–2006 CANPLAY Study, CFLRI

Children's Preferences for Intensity of Activity

Alberta Preliminary Data, 2005–2006 CANPLAY Study, CFLRI

	Prefer vigorous activities	Prefer moderate activities	Like both equally	Prefer neither
ALBERTA TOTAL, CHILDREN (5–19)	12740	11305	12651	9287
girls	11876	10714	12038	–
boys	13524	12124	13191	–
5–10	13323	12158	13375	–
girls	12427	11852	12679	–
boys	13991	12597	14014	–
11–14	13236	11070	13028	–
girls	11978	10393	12114	–
boys	14130	11867	13837	–
15–19	11164	10302	10434	–
girls	11125	9404	10314	–
boys	11230	11721	10529	–
PARENT'S EDUCATION LEVEL				
Less than secondary	–	–	–	–
Secondary	11961	11314	12788	–
College	13062	11612	12841	–
University	13206	11198	12533	–
HOUSEHOLD INCOME				
< $20,000	–	–	–	–
$20,000–29,999	–	–	13293	–
$30,000–39,999	–	10580	–	–
$40,000–59,999	13037	13184	12171	–
$60,000–79,999	11574	10834	12524	–
$80,000–99,999	12495	10601	12429	–
• $100,000	13849	11635	12746	–
PARENTAL ACTIVITY PATTERNS COMPARED TO OTHER ADULTS				
Substantially more active	12914	11918	12544	–
Slightly more active	13079	11435	12820	–
Just as active	12645	11180	12673	–
Slightly less active	12340	11467	12273	–
Substantially less active	–	–	–	–
CHILD PARTICIPATES IN ORGANIZED PHYSICAL ACTIVITY OR SPORT				
Yes, child participates	12738	11684	12972	–
No, child does not participate	12767	10756	11119	–

– Data unavailable because of insufficient sample size.

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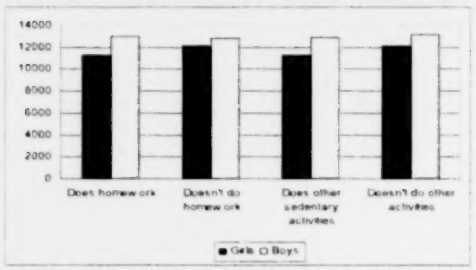
Sedentary Pursuits After School

From the point when the school day ends to dinner time, a child can engage in any number of sedentary activities, such as completing homework, watching television or playing video games. In Alberta, there are no differences in the number of daily steps taken between children who do homework during this time period and those who do not. This is also the case for children who typically do other types of sedentary activities, such as watch television, read or play video or computer games during this time period, compared to those who do not.

Child's Age and Sex There are no significant step count differences, by age or sex, between children who do homework or other types of sedentary activities after school and children who do not. However, among children who do sedentary activities during this time period, boys take more steps (about 1700 more for those who do homework and about 1000 more for other types of sedentary activity) than girls. Also, among children who do sedentary activities after school, 15–19 year olds take fewer steps than children younger than 15. For children who do not do these types of sedentary activities, 15–19 years olds take fewer steps than 5–10 year olds.

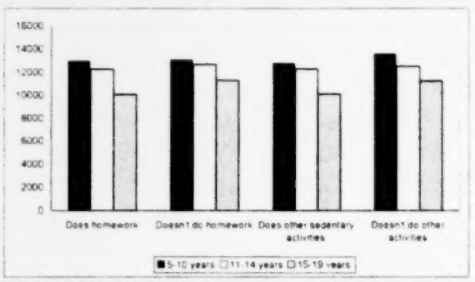
Child's Participation in Organized Physical Activities and Sports Children who do not participate in organized physical activities and sports, and do such sedentary activities after school as watching television, reading or playing video or computer games, take fewer steps than both children who do not participate in organized activity and do not do these sedentary activities, and children who do participate in organized activity, regardless of whether or not they do these sedentary activities. Similarly, children who do not participate in organized physical activity and sports and do homework after school, take fewer steps than children who participate in organized activities, regardless of whether they do homework or not.

SEDENTARY USE OF TIME AND STEPS TAKEN
by child's sex, Alberta



2005–2006 CANPLAY Study, CFLRI

SEDENTARY USE OF TIME AND STEPS TAKEN
by child's age, Alberta

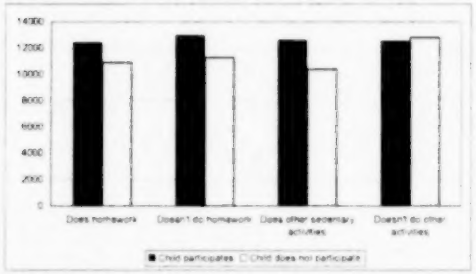


2005–2006 CANPLAY Study, CFLRI

Socio-economic and Demographic factors There are generally few significant step count differences, when examining socio-economic and demographic factors, between children who do homework after school and children who do not. Among children who watch television or play video games after school, those whose parents have post-secondary levels of education take more steps than children whose parents have less than secondary education.

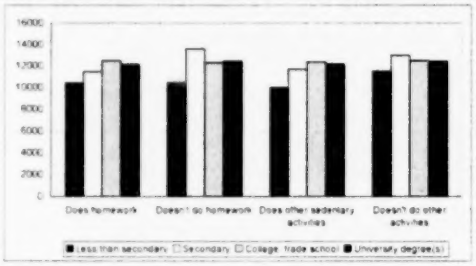
Parent's Activity Level In terms of parent activity level, there are no significant step count differences between children who typically do some type of sedentary activity after school and those who do not.

SEDENTARY USE OF TIME AND STEPS TAKEN by child's participation in organized physical activities and sports, Alberta



2005–2006 CANPLAY Study, CFLRI

SEDENTARY USE OF TIME AND STEPS TAKEN by parent's education level, Alberta



2005–2006 CANPLAY Study, CFLRI

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Sedentary Pursuits After School

Alberta Preliminary Data, 2005–2006 CANPLAY Study, CFLRI

	Does homework between school and dinner		Watches TV, reads or plays video or computer games between school and dinner	
	Yes	No	Yes	No
ALBERTA TOTAL, CHILDREN (5–19)	12066	12556	12080	12605
girls	11276	12185	11265	12144
boys	13020	12808	12865	13163
5–10	13004	13101	12828	13642
girls	12327	12454	12060	13258
boys	13730	13626	13546	14056
11–14	12292	12722	12350	12546
girls	11106	13284	11411	11357
boys	13690	12484	13194	14026
15–19	10104	11322	10129	11278
girls	9904	10914	9568	11291
boys	10416	11602	10764	11259
PARENT'S EDUCATION LEVEL				
Less than secondary	10489	–	10061	–
Secondary	11472	13590	11692	13028
College	12506	12335	12409	12557
University	12177	12491	12197	12489
HOUSEHOLD INCOME				
< $20,000	11261	–	11420	–
$20,000–29,999	12475	–	12525	–
$30,000–39,999	12505	–	12848	–
$40,000–59,999	12103	13471	12469	12964
$60,000–79,999	11657	12195	11581	12381
$80,000–99,999	11581	12087	11679	–
• $100,000	12666	12962	12619	13060
PARENTAL ACTIVITY PATTERNS COMPARED TO OTHER ADULTS				
Substantially more active	12314	13049	12438	12506
Slightly more active	12412	12582	12102	13775
Just as active	12044	12320	12110	12162
Slightly less active	11192	13974	12215	–
Substantially less active	–	–	–	–
CHILD PARTICIPATES IN ORGANIZED PHYSICAL ACTIVITY OR SPORT				
Yes, child participates	12415	12979	12590	12536
No, child does not participate	10881	11267	10370	12797

– Data unavailable because of insufficient sample size

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Active Pursuits After School

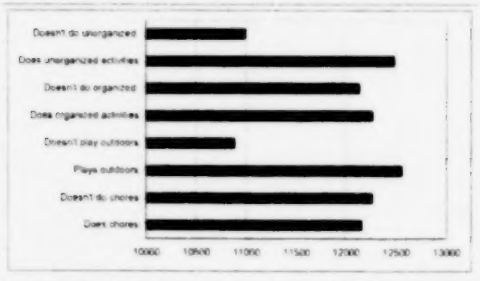
Between the end of the school day and dinner time, children can be active by doing chores, playing outdoors, participating in organized physical activity (such as swim classes or tennis lessons) or participating in unorganized physical activity. Children in Alberta who typically do chores or who participate in organized physical activity after school take an equivalent amount of steps as children who do not do these activities. Children who play outdoors take about 1700 more steps per day than those who do not. Children who participate in unorganized physical activity take about 1500 more steps per day than those who do not participate in these types of activities during this time period.

Child's Age and Sex Boys and girls of all ages who play outdoors after school take more steps per day than those who do not. Boys in Alberta who participate in unorganized physical activities after school take more steps than boys who do not. There are no step count differences with children's age and sex with respect to participation in organized physical activities or doing chores after school.

Child's Participation in Organized Physical Activities and Sports Children who participate in organized activities and who play outdoors take 1400 more steps than those who do not participate in organized activities yet do play outdoors, 1500 more steps than those who participate in organized activities yet do not play outdoors, and 2900 more steps than those who *neither* participate in organized activities *nor* play outdoors. This pattern also appears for children who participate in unorganized activities after school.

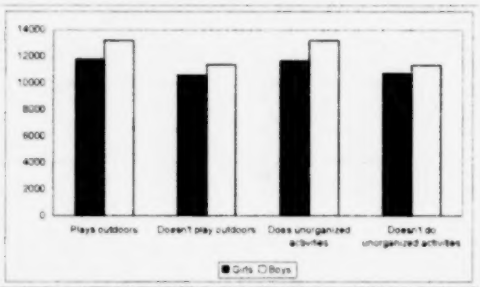
Socio-economic and Demographic Factors There are no apparent differences in terms of socio-economic and demographic factors between children who do chores or who participate in organized physical activities after school and children who do not. In contrast, the number of steps taken by children who play outdoors after school varies by parent education and by household income. Notably, among children who play outdoors after school, children whose parents have a post-secondary education take more steps than those whose parents have less than a secondary school education.

ACTIVE TIME USE AND STEPS TAKEN
overall, Alberta



2005-2006 CANPLAY Study, CFLRI

ACTIVE TIME USE AND STEPS TAKEN
by child's sex



2005-2006 CANPLAY Study, CFLRI

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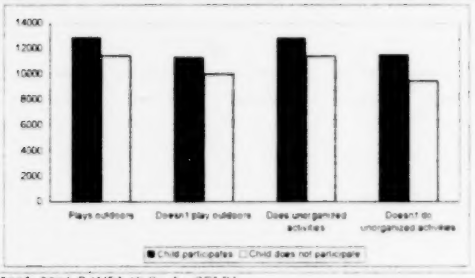
Children who play outdoors after school and who are from the highest income households ($80,000 annual income or higher) take more steps than other children from high income households who do not play outdoors. Children whose parents hold a university education and who participate in unorganized activities after school take more steps per day than children whose parents are university educated yet who do not participate in these activities.

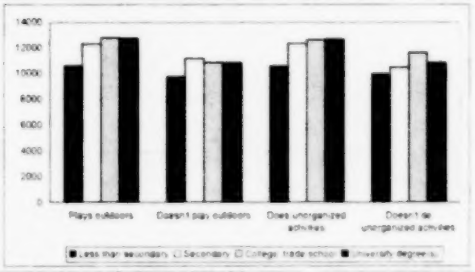
Parent's Activity Level There are no significant differences when examining parent activity level between children who do chores or participate in organized physical activities after school and children who do not. Children who play outdoors and who have parents who are *substantially more* active than other adults, or who are *just as* active, take more steps per day compared to children who do not play outdoors. Children who participate in unorganized physical activities after school and whose parents are *just as* active take more steps per day than children who do not participate in these activities yet whose parents are of the same activity level.

ACTIVE TIME USE AND STEPS TAKEN by child's participation in organized physical activities and sport, Alberta



2005-2006 CANPLAY Study, CFLRI

ACTIVE TIME USE AND STEPS TAKEN by parent's education level, Alberta



2005-2006 CANPLAY Study, CFLRI

Active Pursuits After School

Alberta Preliminary Data, 2005–2006 CANPLAY Study, CFLRI

	Does chores between school and dinner		Plays outdoors between school and dinner	
	Yes	No	Yes	No
ALBERTA TOTAL, CHILDREN (5–19)	12167	12271	12567	10891
girls	11346	11747	11825	10632
boys	13075	12726	13211	11371
5–10	13186	12762	13084	12141
girls	12363	12302	12320	–
boys	14053	13142	13788	–
11–14	12154	12860	12676	11224
girls	11148	12000	11583	10927
boys	13199	13534	13531	–
15–19	10424	10629	10596	10422
girls	9975	10529	10501	9937
boys	11010	10735	10678	11261
PARENT'S EDUCATION LEVEL				
Less than secondary	11040	–	10688	–
Secondary	12150	11852	12287	11152
College	12372	12553	12780	10895
University	12151	12438	12737	10848
HOUSEHOLD INCOME				
< $20,000	11344	–	11329	–
$20,000–29,999	13362	–	12970	–
$30,000–39,999	12997	–	13714	–
$40,000–59,999	12701	12304	12739	11920
$60,000–79,999	11415	12539	12111	10643
$80,000–99,999	11489	12059	12192	9534
• $100,000	12694	12803	13100	11500
PARENTAL ACTIVITY PATTERNS COMPARED TO OTHER ADULTS				
Substantially more active	12376	12547	13021	10713
Slightly more active	12398	12554	12585	11906
Just as active	12334	11705	12582	10390
Slightly less active	11203	13151	12476	10433
Substantially less active	–	–	–	–
CHILD PARTICIPATES IN ORGANIZED PHYSICAL ACTIVITY OR SPORT				
Yes, child participates	12528	12665	12863	11345
No, child does not participate	11118	10676	11442	9979

– Data unavailable because of insufficient sample size

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Active Pursuits After School (continued)

Alberta Preliminary Data, 2005–2006 CANPLAY Study, CFLRI

	Does organized activities between school and dinner		Does unorganized activities between school and dinner	
	Yes	No	Yes	No
ALBERTA TOTAL, CHILDREN (5–19)	12273	12144	12488	10998
girls	11733	11289	11706	10774
boys	12795	13054	13212	11335
5–10	12650	13405	13136	12068
girls	12232	12489	12348	12406
boys	13045	14320	13840	–
11–14	12833	11984	12649	11346
girls	11959	10939	11474	11236
boys	13611	13030	13530	–
15–19	10749	10309	10723	10024
girls	10485	9918	10687	8756
boys	11043	10804	10772	11176
PARENT'S EDUCATION LEVEL				
Less than secondary	–	10167	10610	–
Secondary	11984	12106	12343	10464
College	12212	12662	12612	11658
University	12511	11988	12665	10861
HOUSEHOLD INCOME				
< $20,000	–	–	11111	–
$20,000–29,999	–	12179	12908	–
$30,000–39,999	12134	12653	13972	–
$40,000–59,999	12069	13016	12764	–
$60,000–79,999	11669	11895	12032	10824
$80,000–99,999	11881	11568	12135	9987
• $100,000	12954	12490	12906	12144
PARENTAL ACTIVITY PATTERNS COMPARED TO OTHER ADULTS				
Substantially more active	12239	12663	12754	11587
Slightly more active	12693	12156	12613	11595
Just as active	12232	12019	12441	10739
Slightly less active	11474	12472	12413	–
Substantially less active	–	–	–	–
CHILD PARTICIPATES IN ORGANIZED PHYSICAL ACTIVITY OR SPORT				
Yes, child participates	12356	12923	12815	11533
No, child does not participate	10790	11033	11396	9427

– Data unavailable because of insufficient sample size

Summary

Although children in Alberta appear to be slightly more active than Canadian children on average, taking 12 199 steps per day compared to the national average of 11 685, it is clear that there is still significant room for improvement. This is perhaps best evidenced by the fact that the majority of Alberta's children still do not meet any recommended standards for daily steps:

- 64% do not meet sex-specific BMI criteria
- 77% do not meet the criteria of accumulating 15 000 steps daily
- 86% do not meet the criteria of accumulating 16 500 steps daily (associated with meeting Canadian guidelines for physical activity for children and youth).

Step counts do vary with a variety of factors, as illustrated in Table 1 below:

Table 1: Characteristics associated with Alberta children's step counts

	Child's characteristics	Child's activity	Socio-economic and demographic factors
Higher step counts	– Boys – Younger children	– Participation in organized sport – Preference for physical activity – Preference for vigorous activity – Playing outdoors after school – Participation in unorganized physical activity after school	– Parents with post-secondary education – Higher incomes
Lower step counts	– Girls – Older children	– Preference for sedentary activity – Preference for solely unorganized activity – Liking neither moderate nor vigorous activity	– Parents with less than secondary education – Lower incomes

Many of the differences listed above also appear at a national level. Children's preferences are certainly worthy of consideration, as it can be noted that Alberta children who prefer to be physically active (and more specifically, prefer vigorous activity, playing outdoors after school, etc.) are taking significantly more steps than their sedentary counterparts.

Discussion, Implications and Recommendations

With mounting public concern about escalating pediatric obesity rates in Canada,[10] and the recognition of physical activity as a contributor to preventing obesity, ongoing monitoring of physical activity levels of children and youth has become an increasingly important issue from a policy perspective. As such, federal, provincial and territorial ministers responsible for physical activity have invested in the collection of data, using objective measures to examine physical activity levels of school-aged children and youth, as surveys have traditionally relied on self-report physical activity questionnaires for teenagers and parental proxy reports for younger children (i.e., under 12 years of age).

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Data from CANPLAY indicate that Canadian children and youth between the ages of 5 and 19 take an average of 11 685 steps per day (as recorded by a pedometer). Alberta's children and youth take slightly more steps than the Canadian average at 12 199 steps per day. But what does this number actually mean? In fact, just how many steps should be taken daily for health benefits?

Although no definitive recommendations for an appropriate number of steps have yet been established for children and youth, current literature suggests several guidelines. A U.S. study comparing children's current activity level and body mass proposes that 12 000 daily steps for 6–12 year old girls and 15 000 daily steps for 6–12 year old boys is associated with having a healthy weight.[11] Another study has suggested that 120 to 150 minutes of daily activity is required, comparable to accumulating about 15 000 steps daily for both boys and girls equally.[12] Canada's Physical Activity Guide[13] for children and youth set a goal that children add 90 minutes of moderate to vigorous activity to the incidental activities required in daily living. This amount is equivalent to 16 500 steps daily, using the same logic as that used to establish the 10 000 steps guideline for adults. Using this more rigorous Canadian recommendation, almost 9 in 10 children and youth living in Alberta do not accumulate sufficient daily steps. Moreover, the situation is worse for certain groups; namely, girls and older children, who are less likely to meet the Canadian recommendations for steps to be taken. Although particular attention should be focused on understanding the needs of these two groups, it is clear from the data that inactivity is a problem for all children and youth.

We also know from step data examined at the national level that time spent in certain sedentary activities after school, like watching television, reading and playing computer or video games, is associated with a lower number of steps taken in a day. Similarly, at the national level, active pursuits, such as playing outdoors, are related to increased numbers of steps taken in a day. Not all these relationships appear specifically among Alberta children when examined separately from those nationally. Raising awareness among parents about this lack of physical activity and the amount of screen time is a key consideration for policy makers. Although research has generally been inconclusive about the relationship between sedentary time and physical activity, some research has shown that television viewing is associated with physical inactivity for both boys and girls; computer usage is associated with physical inactivity among males; and reading is associated with physical inactivity among females.[14] Another study examining the relationship between television viewing and physical activity in children suggests that the time after school is an important time for limiting television viewing.[15] This suggests that a public education campaign, targeted to parents to encourage them to regulate screen time, particularly among younger children, may be warranted in Alberta in an effort to increase the amount of time available for more active pursuits.

Another important finding in data collected at the national level and in Alberta involves participation in organized physical activity and sport. Children who participate in organized physical activity or sport take more steps per day than children who do not. Although this finding seems intuitive, what is interesting is that while there is no significant difference between boys and girls when organized physical activities take place *at* school, boys take more steps than girls if the organized activities take place *outside of* school. This suggests that opportunities to be active appear to be relatively equal for both genders at school; however, opportunities outside of

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school are either lacking for girls, not attended by girls or else not contributing as much to overall daily steps among girls as they do among boys.

The relationship with age and gender that appears at the national level is also intriguing. Among 5–10 year olds, those who participate in organized physical activities and sports take more steps than those who do not, regardless of gender and location of the activity. Among 11–14 year olds, the difference is greater if the organized activity is *outside of* school. Among 15–19 year olds, there is only a difference for girls between those who do organized activities and those who do not, regardless of location. Data at the national level show an apparent gender gap for sport participation (that can also include sport participation in school) between young boys and young girls (5–9 years), where boys are more likely to participate in sport than girls. Also, teens are less likely to participate in sport.

Understanding the reasons why these groups are not participating in sport to the same extent may be useful in also understanding differences in activity levels. Perhaps these particular gender and age groups prefer a less organized structure for activity? These factors warrant further examination and consideration in the development of strategies to promote physical activity and sport participation in Alberta.

Another key finding shows that children who like a combination of unorganized and organized activities take more steps than those who prefer either only unorganized (observed in Alberta and nationally) or only organized activities (observed nationally). Interestingly, at the national level, teenage boys who solely prefer unorganized activities take fewer steps than pre-teen boys, whereas there is no difference between pre-teen and teenage boys who prefer organized activities. For teenage girls, however, those who prefer organized activities take fewer steps than pre-teen girls. Understanding preferences for activity is essential for tailoring physical activity strategies for increasing physical activity levels among particular groups.

Two national reports produced by the Canadian Fitness and Lifestyle Research Institute, which describe (1) similar step data to this report, as well as other factors related to physical activity of children and youth, and (2) data collected from a companion school-based study, suggest recommendations to increase the activity levels of children and youth. Considering these, a comprehensive strategy that focuses on children and their parents is warranted. Such a strategy can include increased awareness about physical activity similar to messages used in the VERB campaign in the United States;[16] environmental change strategies; strategies to increase active commuting, including promotion and ensuring that there are safe routes to schools; ample opportunities for daily physical activity at school for all children and youth, which can include further promotion of provincial standards, proven curriculum-based programs like CATCH[17] or the quality daily physical education of the Canadian Association for Physical and Health Education, Recreation and Dance; increased opportunities for a variety of physical activities in the community and at home; and inclusive programs to ensure that everyone can play, regardless of motor development, skills, abilities or disabilities, gender, age or culture.

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References

[1] Tudor-Locke, C., Williams, J. E., Reis, J. P., & Pluto, D. (2002). Utility of pedometers for assessing physical activity: Convergent validity. *Sports Medicine*, 32(12), 795–808.

[2] Tudor-Locke, C., & Myers, A. M. (2001). Methodological considerations for researchers and practitioners using pedometers to measure physical (ambulatory) activity. *Research Quarterly for Exercise & Sport*, 72, 1–12.

[3] Melanson, E. L., Knoll, J. R., Bell, M. L., Donahoo, W. T., Hill, J. O., Nysse, L. J., et al. (2004). Commercially available pedometers: Considerations for accurate step counting. *Preventive Medicine*, 39(2), 361–368.

[4] Le Masurier, G. C. & Tudor-Locke, C. (2003). Comparison of pedometer and accelerometer accuracy under controlled conditions. *Medicine & Science in Sports & Exercise*, 35(5), 867–871.

[5] Vincent, S., & Pangrazi, R. P. (2002). Does reactivity exist in children when measuring activity level with pedometers? *Pediatric Exercise Science*, 14(1), 56–63.

[6] Ozdoba, R., Corbin, C., & Le Masurier, G. (2004). Does reactivity exist in children when measuring activity levels with unsealed pedometers? *Pediatric Exercise Science*, 16(2), 158–166.

[7] Tudor-Locke, C., Pangrazi, R. P, Corbin, C. B., Rutherford, W. J., Vincent, S. D., Raustorp, A., et al. (2004). BMI-referenced standards for recommended pedometer determined steps/day in children. *Preventive Medicine*, 38(6), 857–864.

[8] Epstein, L. H., Paluch, R. A., Kalakanis, L. E., Goldfield, G. S., Cerny, F. J., & Roemmich, J. N. (2001). How much activity do youth get? A quantitative review of heart-rate measured activity. *Pediatrics*, 108(3), E44.

[9] Health Canada and Canadian Society for Exercise Physiology. (2002). *Canada's physical activity guide for children* and *Canada's physical activity guide for youth*. Retrieved July 5, 2007 from http://www.phac-aspc.gc.ca/pau-uap/paguide/child_youth/pdf/guide_k_e.pdf and http://www.phac-aspc.gc.ca/pau-uap/paguide/child_youth/pdf/guide_y_e.pdf .

[10] Tremblay, M. S., Willms, J. D. (2003). Is the Canadian childhood obesity epidemic related to physical inactivity? *International Journal of Obesity*, 27(9), 1100–5.

[11] Tudor-Locke, C., Pangrazi, R. P., Corbin, C. B., Rutherford, W. J., Vincent, S. D., Raustor A., et al. (2004). BMI-referenced standards for recommended pedometer determined steps/day in children. *Preventive Medicine*, 38(6), 857–864.

[12] Epstein, L. H., Paluch, R. A., Kalakanis, L. E., Goldfield, G. S., Cerny, F. J, & Roemmich, J. N. (2001). How much activity do youth get? A quantitative review of heart-rate measured activity. *Pediatrics*, 108(3), E44.

[13] Health Canada and Canadian Society for Exercise Physiology. (2002). *Canada's physical activity guide for children* and *Canada's physical activity guide for youth*. Retrieved July 5, 2007 from http://www.phac-aspc.gc.ca/pau-uap/paguide/child_youth/pdf/guide_k_e.pdf and http://www.phac-aspc.gc.ca/pau-uap/paguide/child_youth/pdf/guide_y_e.pdf.

[14] Koezuka, N., Koo, M., Allison, K. R., Adlaf, E. M., Dwyer J. J., Faulkner, G., et al. (2006, July). The relationship between sedentary activities and physical inactivity among adolescents: Results from the Canadian community health survey. *Journal of Adolescent Health*, 39(4), 515–22.

[15] Hager, R. L. (2006, Nov). Television viewing and physical activity in children. *Journal of Adolescent Health*, 39(5), 656–661.

[16] Huhman, M. E., Potter, L. D., Duke, J. C., Judkins, D. R., Heitzler, C. D., & Wong, F. L. (2007). Evaluation of a national physical activity intervention for children: VERB campaign, 2002–2004. *American Journal of Preventive Medicine*, 32(1), 38–43.

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[17] University of Texas Prevention Research Center. (2006). *CATCH for improved physical activity and diet in elementary school children: Effective and successfully disseminated.* Retrieved July 5, 2007, from http://www.cdc.gov/prc/tested-interventions/adoptable-interventions/catch-improved-physical-activity-diet-elementary-school.htm.

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